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AUTHOR	Bruckerhoff, Charles
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ABSTRACT

The goals of the Head Start on Learning Science project include increasing Head Start staff and parents' awareness of the value of science; introducing teachers to integrated, inquiry-based science; and providing follow-up support to teachers and parents. This document is an evaluation report of the program that contains planning, formative, and summative elements. Formative evaluation assessed the ongoing activities of the program to determine if the project was conducted as planned and the extent to which it was meeting its goals. Qualitative methods of data collection included observation of activities and events, participation in events, structured and non-structured interviews, and collection of documents. Findings indicate that the project is realizing the goal of improving teachers' knowledge of science and science teaching skills. The major shortcomings of the project were found to be in communication, formal conceptual framework, planning, operations, and personnel issues. Recommendations included: improve administration and organization of the project; develop a curriculum for the adult and continuing education as well as programs for pre-school, fifth graders' science, and teenagers; develop a conceptual framework, curriculum, and instruction consistent with Head Start on Learning Science mission for culture, society, and education; and hire only certified pre-school teachers and committed, experienced parents for summer programs. (JRH)

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ED 401 121

Head Start on Learning Science

1995 Evaluation

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by
Charles Bruckerhoff
Curriculum Research and Evaluation
August 15, 1995

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Curriculum Research and Evaluation, 237 Singleton Road, Chaplin, Ct 06235; 860-455-1229; Fax: 860-455-0011

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HEAD START ON LEARNING SCIENCE

by
Charles Bruckerhoff
Curriculum Research and Evaluation

EXECUTIVE SUMMARY

The Head Start on Learning Science project was realizing the goal to improve Head Start teachers' knowledge of science and science teaching skills. The major shortcomings of the project were in communication, formal conceptual framework, planning, operations, and personnel issues. These are substantial problems. If the project was to continue to receive funding from the federal government's Health and Human Services Department, its principal investigators had resolve these problems right away.

RECOMMENDATIONS

- Act upon the evaluator's interim recommendations.
- Improve administration and organization of the project, capitalizing on the strengths and recognizing the limitations of key participants, and establish administrative procedures and records normal for major projects.
- Improve documentation, including description of the project in practice and theory.
- Develop a curriculum for the adult and continuing education as well as programs for pre-school, fifth graders' science, and teenagers. Assure that all aspects of the project are evenly developed, serving its intended beneficiaries well.
- Appoint Reverend Abraham or someone else with similar qualifications as an equal partner in the administration.

Curriculum Research and Evaluation, 237 Singleton Road, Chaplin, Ct 06235 860-455-1229 Fax: 860-455-0011

- Develop a conceptual framework, curriculum, and instruction consistent with the Head Start on Learning Science mission for culture, society, and education of these pre-schoolers.
- Work with the evaluator for timely , coherent, and effective evaluations.
- If quantitative, empirical research is desired, establish its purpose, design, and time line well in advance of year two, and maintain the budget for evaluation.
- Use technical support services, in particular sensitivity training, that are available from the Department of Health and Human Services, Head Start, and other recommended sources to address these most important issues.
- Improve communications by having regular phone and fax service and e-mail.
- Establish a board of directors to provide oversight for the project.
- Hire a skilled person, perhaps a parent, to do clerical work for the project's administration.
- Hire only certified pre-school teachers and committed, experienced parents for summer programs.
- Consult with Head Start and pre-school experts nationwide.

Upon finding out that the Head Start on Learning Science project would not acknowledge its problems and adopt these recommendations, Curriculum Research and Evaluation voluntarily removed itself from further involvement with the project.

The report to follow has been revised in the following manner: the current title is different from the project's original title and pseudonyms are used for individuals and locations.

I. INTRODUCTION

A. Overview of original proposal, including purpose, goals, and activities

In 1994 the private university received a two year, $550,000 dollar grant from the U.S. Department of Health and Human Services for "A Head Start on Learning Science: The City Model." The project's three purposes were: (1) to increase Head Start staff and parents' awareness of the value of science; (2) to introduce teachers to integrated, inquiry-based science; and (3) to provide follow-up support to teachers and parents. The principal investigators of the grant were a professor of biology and medical technology at the private university; a person who holds a doctorate in biochemistry and is a certified teacher and grants person; an assistant professor of elementary education at the private university; and an associate professor of special and early childhood education and director of the Early Childhood Center at the private university. Local collaborating agencies were the Community Improvement Team; South City Public Schools; State Academy for Education in Mathematics, Science, and Technology; and the State Department of Education. The project also collaborated with the State Community Technical College, the Science Center of the State, and the Iron Mountain Science Center.

The project intended to have its most direct impact on two Head Start sites: Havenhill School in South City and Ames Child Development Center in City. Its plans included recruiting every Head Start teacher, aide, home visitor, and every education and service coordinator at the South City and City sites. There were 16 eligible staff members at each site. The project expected to involve a critical mass of at least 70% of the participants.

The original plans called for an institute for the Head Start teachers to tailor a professional development program to the specific needs of the teachers and establish beforehand a baseline for evaluation. During spring 1995, in preparation for the summer institute, the project's staff would make four visits to each Head Start school to observe, record, monitor, and interview. The summer institute itself would consist in a lecture and

demonstration course meeting twice weekly for six weeks for three hours each week. Also, a laboratory course, consisting of thirty-six hours of field experience, would meet twice each week for three-hour sessions and include integrated, inquiry-based, hands-on science activities.

During fall 1994 and spring 1995, the project's staff would develop a curriculum which would accomplish the project's major goal, "to integrate age- and individual-appropriate, inquiry-based science throughout the curriculum and into the daily lives of teachers, children, and parents." To accomplish this goal, the operations and materials of the new curriculum would help "teachers view each child as unique, to encourage each child to initiate and pursue personally satisfying exploration, and to involve parents as partners in their children's explorations."

To sum up, the original proposal presented an approach to professional development of Head Start teachers that was somewhat standard. It was an in-service program that delivered specialized content and skills to the teachers, with a provision for on-site technical assistance. The program was unusual, however in its trying to improve teachers' knowledge of science and their skill with inquiry-based teaching, considering that little attention is commonly paid in other comparable programs to introducing academic knowledge—especially science—to pre-school children and their teachers.

B. Project's choice of sites

In the spring of 1995, the principal investigators concluded—on the basis of observations, recording, monitoring, and interviews—that the Head Start teachers at both sites had a high level of appreciation, commitment, knowledge and skill in teaching pre-school children in general and in teaching science to these children in particular. This conclusion, in the words of the principal investigators, all but rendered their project "superfluous."

In the Progress Report of April 5, 1995, the principal investigators summarized their discovery:

> *The outstanding conclusion is that the children at both sites are happy, enthusiastic, and active. The activity is varied, exploratory, creative, cooperative, and constructive. Teachers and aides are warm, caring, supportive, dedicated, and highly skilled. Teachers at both sites are interested in learning how to enhance science in their classrooms, and we will work on this at the Summer*

> *Institute. We can enhance science process skills and provide materials to enhance discovery. We can also enhance nature appreciation. But the most important discovery is that the need for intervention is not in the classroom. No one would want to make major changes in the way things are done at these Head Start sites....We have found our central question: How can we capture the interest of parents?*

Clearly, the Head Start programs chosen for this project were not in any trouble (Zigler 1992, 40). However, the progress report gave no explanation or source for many of the above stated concerns, unless the reader assumes, correctly, that they are good, general criteria by which to judge any school. But in that case, two conclusions are warranted: first, the principal investigators did not know the sites well enough before writing the proposal and, second, they assumed that conditions at the South City and City sites were bad. Why?

The original proposal made no mention of transforming the local Head Start teachers into "warm, caring, supportive, dedicated, and highly skilled" educators. The original proposal did take into account the horrible social conditions, all too common in cities like City. In the milieu of urban poverty, with its dense population and high incidence of crime, the Head Start on Learning Science program would be sorely needed and would face its greatest challenge in its drive to become a national model. Yet no one familiar with public housing projects would assume that everyone who lives there fits the mold of the tragic characters reported in daily newspapers. The real tragedy of urban poverty is that so many really good people, especially children, are hemmed in by the few people, sometimes organized in gangs, who are prone to violence, self-abuse, and illegality. The main purpose of institutions like Head Start is to help good people build healthy, coherent lives and break the cycle of poverty (Gingrich 1995, 71-75 and Zigler 1992, 2-8).

Near the end of March, a new purpose and a new strategy for the project were chosen. They still emphasized the teachers' professional development but added several components which focused on the children's family, parents, health, and community. These new elements are not only hallmarks of Head Start itself (Zigler 1992, 43) but also consistent with current thinking among leading scholars in the fields of early childhood education and the history and sociology of education, particularly in reference to African-American children (e.g., James

Comer, David Elkind, Edmund Gordon, John Ogbu, Thomas Sowell, William Julius Wilson, and Edward Zigler).

On April 7 the principal investigators submitted a revised proposal to the Department of Health and Human Services. The key to the new concept and organization for the Head Start on Learning Science project came from an individual, Samuel Abraham, program director for the North City Neighborhood Resource Center, who had previously had no association with this Head Start on Learning Science project. While the principal investigators are white and middle class, Reverend Abraham is a black man with substantial experience among urban poor people and has a doctorate from Yale. He knew what this program should emphasize. In the words of the principal investigators, "he saved the project."

C. The revised proposal

The 1995 summer institute for the Head Start teachers and parents remained essentially as originally proposed. It emphasized science skills and how to integrate science into daily activity besides providing materials to enhance discovery and paying some attention to inquiry and nature appreciation. The Head Start teachers received instruction in a *core training program* and in *modules*. The core training program took place on separate occasions at the two sites and focused on developmentally appropriate practice. The modules brought together all of the Head Start teachers from both South City and City for workshops on the uses of materials for science instruction for pre-school children.

Pre-School Program: According to the revised proposal, "The greatest need is not to change these Head Start teachers and aides, but to magnify their impact. We need to teach Head Start staff to enhance effectiveness in helping parents help children." As a result, the one-credit field component of the summer institute was replaced with an eight-week Head Start on Learning Science summer program for parents and their children, beginning June 26 and ending August 18. The objectives for parents were: (1) to increase parents' awareness of the value of science, (2) to provide materials and instruction to support science activity by and for parents, and (3) to provide follow-up support to parents after the summer.

This family-oriented summer pre-school program would help the Head Start on Learning Science project reach its goals by, "assisting

parents to increase knowledge, understanding, skills, and experience in child growth and development, and identifying and reinforcing experiences which occur in the home that parents can utilize as educational activities for their children." The Eli Whitney School, where Reverend Abraham operated the Neighborhood Resource Center, became a "pre-school 'laboratory'" where parents were put "in charge of pre-schoolers in a classroom setting with supervision by qualified teachers." Each parent (at least one) whose child enrolled in the summer program had to commit himself or herself "to spending at least one day each week in the classroom supervising the children and at least 3 additional hours each week in parent activities." Although Reverend Abraham's association with the Head Start project was a voluntary commitment (his first duty was the Neighborhood Resource Center), every day he made the rounds to visit and manage the classrooms and other activities associated with the summer institute.

Head Start teachers from the Ames Child Development Center had committed themselves to spending twelve hours working in the summer pre-school program. (The question has not been answered on what to do about Havenhill during the project's second year.) They were to teach the parents how to teach the pre-school children about science. In the completion of this work, the Head Start teachers would practice using the materials and principles of instruction that they had received in the core training program and modules. In the end, the teachers would "integrate science into the daily life of this neighborhood." The parents would eventually be divided into two groups: parent volunteers (limited involvement because they had other responsibilities) and parent teachers (daily involvement, because their schedules allowed more time on site).

Parents Program: Also, the project promised to "offer a variety of programs for parents with a particular emphasis on science." Six science-related programs were designed for parents.

- *A round table discussion will take place every day from noon to 1:00 p.m., when parents arrive to pick up their children. Topics were "parenting skills, child development, discipline, homework, stress management, budget management, nutrition, diet planning, cooking, health, safety, etc." Networking and cooperative supportive among parents will result.*

- *A health club will be organized to help parents learn about health care and to use the equipment in the facility so that they can improve their health. Parents can learn about health, exercise equipment, anatomy, and physiology. Health screening will be required of all participants. The health club should help improve parents' interest and commitment to the school and help them "learn the relevance of science in their own lives, and they will teach this relevance to their children."*
- *A certified instructor will offer a nine-hour first aid course that includes "infant, child, and adult CPR."*
- *A course in self-defense will be offered that will also teach the physics of movement and balance.*
- *Gardening will occur 9:00 a.m. to 12:00 p.m. daily. Garden spots will be prepared and different fruits, vegetables, and flowers would be planted and cared for by the parents and children, so that they can learn about science and aesthetics.*
- *Aquariums will be installed to "enhance interest in water animals and plants."*

Mentor program: The Head Start on Learning Science project would recruit fifth grade girls from the Eli Whitney school to "study nature, gardening, exercise physiology, health, nutrition, first aid and safety, and child care and development." The fifth grade girls would participate in the pre-school and parents programs. Also, they would have programs especially for them, including a science club, a project constructing nature trails on the private university campus, and mentoring from students in the "Women in Math, Engineering, Technology and Science" program at the City College for Women.

During the third week of the summer program, a group of 15-20 teenagers—both boys and girls—would join the project as mentors for the pre-school children and classroom assistants.

Music program: There would be piano instruction, chorus for parents and children, and concerts. In addition, "Dr. Theodore Rinkle...who is nationally known for his work on the acoustics of violins and for his entertaining style of speaking, will give one or more seminars on the science of sound and music."

Aquatics: Swimming lessons would take place at City's Riverside

Middle School, located nearby. Additional topics were "questions of buoyancy and [to] demonstrate how, by weighing ourselves on land and in water, we can estimate body fat content."

Finally, two one-credit practicum courses would be offered in South City and City in fall 1995 and spring 1996, as planned in the original proposal. The principal investigators decided to discontinue technical advisors (graduate students from the private university) because their services were no longer needed. The funds originally for technical advisors would be used "to hire parents who complete the summer program as classroom aides. In this way they will be able to learn from the Head Start teachers, perfect their own skills, and acquire confidence. With this enhanced ability, the parents will be invaluable community assets."

D. List of main events of 1995—Time line for January through August 15

Although it was requested, no such list was provided.

II. PERSONNEL AND SETTING

The principal investigators and the other key participant were introduced in the previous section. The complete list of participants included certified Head Start teachers; Head Start teachers as yet without certification but who were in the process of completing their requirements for it; parents who volunteered a minimum or no time to classroom work; parent teachers who agreed to attend a brief training session focused on the Head Start on Learning Science program and worked on a regular basis in the three pre-school classrooms; fifth grade girls; teenagers; directors of the fifth grade girls' program; clerical assistants; and outside experts from the private university, and the Iron Mountain Science Center; music, movement and dance, and health instructors; and maintenance personnel. Most parents who participated in the project were women—mothers of the pre-school children enrolled. One father came on some of the field trips. His perception of the program is described below.

Two Head Start sites

Havenhill School was in South City, a suburb a short drive from City, across the nearby river. The Head Start program there served the South City Public School District. The building was a single level brick building surrounded by some older single-family homes as well as modern condominiums and apartments. The neighborhood of the school was quiet where the houses and apartments were but noisy where cars rushed along a busy street. A huge grassy field surrounded the school. In it was a large, fenced-in play area with equipment (a sand pit, swings, slides, and so on) designed for pre-school children.

Inside the Havenhill School, it was generally quiet, although the children's and teachers' voices were constantly abuzz. At one end of a long corridor was a large, general-purpose room where the children ate meals, played indoor games, or performed on a stage; teachers held staff and in-service meetings; and parents, the school board, or other members of the community assembled. Arranged along the other end of the corridor were 8-10 classrooms. Each classroom had a certified Head Start teacher with approximately 15 children (boys and girls of different races

and ethnic groups) and was fully equipped for pre-school. A head teacher administered the program, assisted by a secretary.

The Head Start teachers at Havenhill School had a well-defined curriculum that encompassed all aspects of a high-quality program for early childhood education. When the evaluator interviewed teachers there, they demonstrated a firm grasp of the situation in general, expressed a considerable self-confidence, showed that they understood very well what they were doing with the materials, and managed their classrooms well. Science projects and experiments (such as small plants and animals), books, and basic equipment (tweezers, magnifying glasses, etc.) were in various places around the room. Along every wall and in every corner there were special nooks or seating areas often for a specific activity (reading, displaying children's creations, or keeping fish bowls). Everything was arranged for an educational purpose but not so ordered as to appear untouchable. The unaccustomed adult eye might tire quickly here, but to the Head Start teachers and their children, the myriad artifacts and animals offered a fantastic array. The teachers' rooms constantly offered opportunities for pre-school experience, including appropriately designed and executed formal lessons. Every day in every classroom, a lively routine unfolded that stimulated the interests and imagination of children and teachers alike.

The Ames Child Development Center was in the west end of City, in an area called the Lower Basin Neighborhood. The Head Start program, housed in a two-story brick building, served parents and children who lived here. The building was on a corner of a block surrounded by older buildings, many of which badly needed repair or should be demolished. Everything that came with urban blight was here. Lower Basin Avenue was an area known for crime. The Lower Basin Neighborhood Collaborative was formed only one year ago to organize local citizens and restore safety and prosperity to the area.

Outside of the Ames Center, near the rear and north sides of the building, was a small, barren, fenced-in playground with equipment. Inside the building there were four - five rooms on both floors with stairs and corridors joining all. The head teacher's office was on the first floor. Since there was no large general-purpose room, like the one at Havenhill, children ate their meals in their classrooms. Approximately fifteen

children (boys and girls) were in each room. During operating hours it sounded like a pre-school program should; children's and teachers' voices never stop.

There were important differences between the Head Start programs at Havenhill and at Ames. Some of these differences were subtle and not easily noticed, like whether a teacher was fully certified or how and why a teacher disciplines a child. And some differences were obvious, for instance, most of the teachers and children at Ames were African-American, whereas at Havenhill most of the teachers were white, and the children, as stated earlier, came from different races and ethnic groups. All of the teachers in both centers were women. Both had a well-defined curriculum. Both had Head Start teachers who knew what they were doing and were self-confident. They were unflinching and willing to be interviewed on camera—impromptu when asked by the evaluator. The classrooms in the Ames Center, like those in South City, were filled with materials and equipment specially designed or chosen for early childhood education. All of these things for the children were arranged in special places. No classroom was like another in detail, but every one demonstrated the principles of a good early childhood program. Corners, tables, hutches, floor spaces, walls and ceilings were used inventively to house a multitude of mini study, work, demonstration, or play areas. Every classroom was a living creation of its teacher and her students for that year.

When the little children arrived on buses, the teachers greeted them warmly at the door and escorted them in orderly lines to their rooms, chattering all the way. Once inside, the teachers sprang into action with their children. Whole group instruction alternated with small group lessons, always for a purpose. A routine was established and followed, but when the evaluator was there it never appeared to get in the way of good activities or to be a nuisance. The timing and choice of activities were just right for the children most of the time. Not surprisingly, the common difficulties for the Head Start teachers were children's behavior. Often one child would have something that another child would want and the teacher had to settle a squabble. Lessons, such as identification and review of the weather pattern for the day and week, almost always involved mini remedial lessons on "wait for your turn."

The style and content of these two programs were different. Teachers at the Havenhill School emphasized more the introduction to formal knowledge in all of the disciplines. At the Ames Center it was not that there was no introduction to formal knowledge (there was), but rather that the children's socialization had higher priority, and not merely for the sake of discipline. At Ames, the Head Start teachers we proud of their own heritage, whatever their race or ethnic group, and demonstrated their pride in the clothes they wore, their hair styles, jewelry, and so on. Their curriculum and instruction were infused with the values of the people who lived in this part of the city. The teachers knew the local culture well, perhaps in part because some of them grew up here.

During interviews, teachers in Ames and Havenhill stated that they always needed and wanted help in staying up to date on academic knowledge, when the in-service providers, for example, university professors and technical support personnel respected them for who they are—early childhood educators who know what they are doing when they work daily with four and five year old children.

III. RECORDS, DOCUMENTS, INSTRUMENTS, AND DATA

A. Administration of the project

To understand and then describe and explain the administration of the Head Start on Learning Science project, the evaluator asked the principal investigators to provide as many documents on the project as possible. These materials would complement data collected from interviews, observations, and surveys for the project's first year-end report. The evaluator received only the Italicized items before the August 15 deadline.

Materials and documents:

- schedules for all organizational meetings held during 1994-95 (including dates, times, locations, and cancellations);
- official minutes of all organizational meetings;
- formal statement and design of the framework for curriculum and instruction in science for pre-school children;
- *formal statement and design of the comprehensive plan for children, parents, and community, particularly as this new social/cultural dimension relates to the curriculum and instruction in science (above);*
- revised budget;
- accounting of all major purchases of equipment, materials, exhibits, etc. (both intended and actual purchases);
- *course syllabuses or working plans for all courses and workshops;*
- original time line for activities and any revisions for two year period;
- *schedules, titles, dates, times, locations, and revisions or cancellations of all workshops and courses;*
- schedule of all observations made by PI's January - March 1995;
- notes and other documents collected and recorded by PI's from observations January - March 1995;
- *parents' contract for participation;*
- names, addresses, and phone numbers of all principal players in the organization, including teachers, parents, and PI's;
- names, positions, addresses, and phone numbers of all instructors;

- names, addresses, and phone numbers of all teachers and head teachers;
- names and attendance records of all fifth grade students;
- names and attendance records of all pre-school children;
- names and attendance records of all parents;
- finally, any and all documents and other things produced for this project.

Official meetings and agenda: Interviews show that formal meetings were held by the Principal Investigators. For the first several months these meetings addressed general concerns such as site visits and the organization of the summer institute. In late March, when the Principal Investigators decided on a new focus and a revised proposal, meetings were held weekly until the Head Start summer program began. Apparently, there are no records of the formal meetings. The principal investigators produced no agendas, no minutes, and no formal statements of a conceptual framework, design, or policy.

Decision-making process: Design and effects: The four Principal Investigators were called "Co-Directors." They referred to their decision-making process as "consensus" and officially reported that they "have never had the least difficulty in reaching consensus."

B. Strengths

The administration of this project was comparable to a small family. Everyone knew everyone else, and they came together to solve problems when the occasion required them to do so. Like any family, an informal atmosphere prevailed. Formal proceedings rarely occurred, certainly never in accordance with Robert's Rules of Order. Binding the Principal Investigators together was their affiliation with the private university. Another tie was their belief in the importance of doing something to improve poor children's social conditions, especially their science education. That they all had doctoral degrees was a third tie. Also, each one had a background or appointment in education, although there were some important differences in personal history or experience, academic preparation in early childhood education, and current employment. To illustrate, one of the co-directors did not have an appointment at the university, one specializes in science, one specializes in early childhood education, and one concentrated on elementary science education. The

co-directors were two males, two females, white, middle-aged, middle class, married with children, two were married to each other, and all lived in suburbs or towns outside of the city. Everyone agreed willingly to be interviewed and offered a number of suggestions for follow-up. No one spoke ill of anyone else, although everyone was candid about their own shortcomings, those of the other co-directors, and the project.

C. Weaknesses

On the one hand, the "family" of the project's administration was a good thing, and it worked in the project—to some extent. On the other hand, a family is not the proper recipient of a $550,000 grant, like the Head Start on Learning Science project, an important effort to make a national model for early childhood education. And every principal investigator in this project felt the weight of this responsibility. However, in our society, parents aren't held accountable for having children; they simply have them. Likewise, families do not expect to be audited, evaluated, or inspected by agencies (and they should not be), so they don't keep official records of their day-to-day affairs. Also, a family, with full privileges to help each member to become whatever he or she might, is constantly making things up as it goes along in life. There are long-term and short-term plans, but it is rare to find a family that officially documents these things. They talk, agree, might keep a diary or journal, and, collectively at least, they remember the important things.

The loose, informal structure that works so well for the small family did not work well for this project. It left too much to chance and, at least implicitly, held no one or an aspect responsible for the effects of decisions.

Interviews and observations suggest that little or no consideration was given by the principal investigators to any other organizational framework for the project (see Argyris and Schon 1974 and Schon 1982). Also, since there were no formal documents at all of the meetings, such as agendas and minutes, there was no official record of their proceedings. Hence there was no objective means of identifying or tracing the decisions, sources of influence, or effects of the grant's administration. The knowledge of everything that was done or would be done depended on memory. Again, if the project and its operations are simple and of relatively short duration, an informal approach might suffice. However,

interviews show that, not surprisingly, the different principal investigators had different and incomplete recollections of meetings.

Communication was poor within the administration. Simple phone contact between principal investigators was difficult because there was usually no one to answer the main phone and there was no answering machine for messages. There was no fax machine and no e-mail. Apparently, the project made little use of technology for teaching science, for professional development, or for communications, in contrast with the State Academy for Education, which viewed telecommunications and instructional technology as important means of improving the teaching and learning of mathematics and science in the state.

But how did this administration respond to problems? To answer this question, it was necessary to observe activities and get the perceptions of outsiders. In this project, the outsiders were parents, Head Start teachers, teenagers, fifth grade girls, and support staff. Interviews of these people and observations of the program itself reveal that some aspects of the project proceeded satisfactorily according to a plan. For example, the Head Start teachers generally agreed that the Core Component and the Science Modules were well planned, relevant to their needs as pre-school teachers, and executed professionally.

By contrast, interviews and observations from different groups of participants in the Head Start summer program revealed that they were in agreement—and disappointed—that the program lacked the coherence, organization, and the direction they had expected. Head Start teachers came to the summer program expecting to teach lessons to the children for two hours (with assistance from parent teachers and volunteers), but they invariably walked into a situation which they described in these words: "It's chaos here. There aren't enough things for the kids to play with, and nobody knows what they are supposed to do, not even me." Parent teachers and Head Start Teachers reported that they usually had no one guiding their work. They could choose any topic they wanted for a lesson, as long as they thought it had something to do with science. They had instructions to use the materials and lessons they received in the institute and, often, they did. However, after stating that few instructional materials were available in the rooms, they said, "All these kids can do is run around. They are bored here. I'm bored here." Also, several

features announced, hoped for, or planned were either unsatisfactory (round-table discussions), or never occurred (full parent's involvement and roller skating), uneven (family science nights), or were discontinued (round-table discussions, guidance for parent teachers, and gardening).

The father mentioned earlier who attended some of the events said about the Head Start summer program:

> "*I want a program like this for my little girl, but I have some concerns. Why do they do it in this way? You see that there are no other fathers here. How does this program expect to have working fathers here, like myself? If I can get away from work for a day, I'm going to be here with my little girl. Like now, I'm on vacation. But, how can I plan to attend anything that my daughter is doing here, if I have no advance notice? They send something home the night before. I can't be here on such a short notice.*"

In this father's opinion, an opinion shared by other participants, so much in this project was done on the spur of the moment that no one who was busy could adjust their schedule to accommodate the offerings. The Head Start teachers, who were accustomed to routines, a well-developed curriculum, and planning in advance of teaching, were puzzled. They liked the general idea of the program and wanted it to work, but they were disappointed with its freewheeling style and unpreparedness.

If consensus was used to define the project's decision-making process, it was so mostly in spirit, not in deed. Consensus means harmony, cooperation, or sympathy, and decisions would be unanimous. In a situation defined by consensus, one should not expect to find anyone exercising the authority so typical of top-down decision-making. That would be consensus by fiat. However, the most important decisions of this project were not made in a group in which everyone had an equal share. Some principal investigators exercised full authority in all important decisions. Others served more as consultants or technical assistants.

Staff meetings were held in the Neighborhood Resource Center every Thursday at 1:15 p.m. The purpose was to discuss the program in general, daily and weekly activities, and "grievances or praises anyone may have." Reverend Abraham served as chairperson of these meetings. The data show that he is a highly skilled administrator, but often his efforts to

manage a professional staff meeting were cut short by the teachers' grousing about the program (e.g., teenagers' behavior or the second field trip to go swimming) or the principal investigators' decision-making authority.

Also, if the administration of the project is harmonious and cooperative, then the operations should also be so. Every participant should feel that he or she is welcome and has an equal opportunity to help make decisions when he or she has the requisite knowledge and skill. However, the Head Start teachers and parent teachers were often told that they did not know what science was or that what they were doing was the wrong kind of lesson for pre-school children.

Three examples of this catch-22 will illustrate the contradiction in practice as well as the errors made by the principal investigators. One day a Head Start teacher planned to present a lesson about waves to the children. As materials she chose bottles, water, oil, and food coloring. The idea was to have the children mix the fluids in the containers and observe and report on the results. She would then help the children understand or at least appreciate principles of waves. However, while she was presenting this lesson she was told that the wave experiment was not science.

On another day, a Head Start teacher was planning to give a lesson about force and movement to her children. She would have them use string, straws, and inflated balloons to construct and launch little rockets. They would all have fun launching the rockets and then they would ask: Why does the balloon make the straw fly up the string? The Head Start teacher was told this was not science, at least not for the children, and she was not given the materials she requested for this experiment.

Finally, the fifth grade girls yearned to go roller skating at some point in the eight-week summer program. For them it would be the culminating event of their summer science program. Their co-directors were convinced that there was ample opportunity for the study of elementary physics in a roller skating rink. Also, the girls said that they loved skating and they were bored by the planned activities. Roller skating was ruled out and described by principal investigators as "inappropriate for science." Track was suggested. The fifth grade girls were not pleased. Hence, what is science and what is not science were determined in a top-

down fashion.

This last example serves another purpose. The revised Head Start on Learning Science project, with its new focus on family and community, still intended to help the impoverished, inner city, African-American children prepare themselves for science. However, none of the principal investigators is African-American and, apparently, none has a record of research on the social conditions of urban minority children, particularly African-Americans. Of course, no rule says they must have such qualifications to do this work—nor should there be any such rule. The true test of the administrators' sensitivity to the social and cultural differences between them and the urban African-American community comes in the practice. The question to ask is: What do the participants think about and how do they respond to the administration of this project, particularly regarding sensitivity to social and cultural differences?

Data show that the principal investigators were insufficiently familiar with the urban African-American community. To their credit, the administrators of this grant readily acknowledged this deficiency. In fact, they told the parents and children that the private university had yet to demonstrate its commitment to the citizens of the city. They said this program would be a step in the right direction. But they themselves had not developed a formal organizational structure to compensate for their own weakness. An example of such a structure would be a board of directors made up of leaders in the local community, who would supervise the administration. In this instance, a board of directors consisting of leaders from the Lower Basin Neighborhood would help the grant's administration to avoid and resolve problems of friction or inappropriate conduct between the different races and cultural groups in this project.

Under these circumstances, such a structure is a necessary and common sense precaution, regardless of this project's particular outcome. And in a democratic society, it makes good sense in terms of ethics and business for local people who are affected by a project's policy or practice to oversee it. To the ordinary person, science might seem to be an objective, value free topic to introduce to pre-school children, so why worry about sociological issues? Indeed, science should not be subjected to political or ideological whimsy (Wilson 1995). However, the teaching

of science is never free from values, because teachers choose the content of instruction and use particular attitudes and methods when they impart the knowledge and skills of science to students. When the principal investigators of the Head Start on Learning Science project changed its direction from improving the teachers' knowledge and skill with teaching science to pre-school children to the broader and more controversial interest in changing the family and community, the administrators failed to recognize their limitations. They would be well-advised to consult with officials from other universities (e.g.,Yale) who are attempting to redefine its role vis-a-vie its host city.

The principal investigators of the Head Start on Learning Science project made some serious mistakes in their treatment of science and science education. The following examples should suffice. First, as reported in the first section above, the principal investigators found a mismatch between their original proposal and the local Head Start sites. More to the point, when the principal investigators observed the South City and City sites, they concluded they were mistaken about the educational conditions. They discovered that the teachers were warm, caring people who knew a lot about early childhood development, the Head Start curriculum, and the methods of teaching appropriate for four- and five-year-old children. This discovery led to the development of the revised proposal emphasizing family and community. It also might have prompted them to conduct a more intensive study of the social and cultural conditions—the people and places where they planned to have an impact. In other words, when they discovered that they were mistaken about the teachers' knowledge and skills, then they should have made this other hypothesis: perhaps we do not know much or are mistaken about the social and cultural conditions of these children and their parents. The principal investigators have not presented any research or reports showing that they had explored the local culture.

Second, even a brief foray into the immense literature on the diverse cultures in the United States and its current social problems should have sufficiently warned against a naive or hasty or judgmental approach to cross-cultural policy and practice. (Note the great diversity of opinions represented in the above listed authorities on sociology and history of education) Why, then, did the principal investigators insist on having

only certain kinds of food served at meals sponsored by the project? For example, a cookout was planned for the last week of the Head Start summer program. The parents and children expected to eat hot dogs. Something that most people in America would associate with a cookout. However, the principal investigators insisted that, if hot dogs were to be served at all, they had to be fat free, preferably made from turkey, not beef. Why did they take a stand on this? It seems eccentric considering that some of these four- and five-year-old children sometimes go to bed hungry because no meal was prepared or there was no food at all. Some of the fifth grade girls and teenagers have known this hunger far longer. Finally, during one session a teenagers was used as an example to others and to herself. She was told her in front of everyone that she should pay special attention to the topic on diet because she is overweight.

Far fewer teachers and parents participated in the summer program from the fourth through the eighth weeks, as could be expected considering the data from observations and interviews. In explanation of this result, one parent said, "You see, some of these people who live in the city, they just don't know much about white people or they don't care to know, so they go along with the program. They won't say anything. After all, they are getting something for their kids. But then they will quit when they have had enough." The fifth grade girls, teenagers, teachers, and parents individually volunteered the above descriptions and criticism of the project. No one was prompted. The declining attendance was anticipated by the evaluator, based upon data from the observations and interviews.

To sum up, the administration of this project was defined as consensus. Data from interviews suggested decision-making would be cooperative. The situation would be open, in that everyone would feel free to express opinions about the project and be treated equally, not only within the administration, but also among the other participants. Thus, the directions taken would be supported by the consent of participants. What was good for one would be good only if it was good for all.

While there was some evidence of consensus in the administration of the project, more often than not, decisions were made in a top-down manner. This process unfolded in operations generally and in meetings specifically. There is nothing necessarily wrong with top-down decision

making; many examples show it can be applied to good effect. However, the greatest hazard of the top-down approach is that its administrators will not recognize or not be concerned with the impact of decisions on others. No evidence suggests that anyone in this project intended or practiced racial discrimination. But there were examples of inappropriate or insensitive conduct toward participants in the project.

This is a serious problem, but it can be remedied. First of all, it would be imperative for the project to establish a formal organizational structure appropriate for major projects, including a board of directors. Secondly, the administration would have to establish formal procedures for all meetings, including agendas and minutes. Thirdly, the principal investigators should hire a consultant in cross-cultural relations. The popular term for this technical assistance is "sensitivity training." When the evaluator described these conditions to other experts in program evaluation and in professional development of teachers, they strongly recommended without hesitation that the project receive sensitivity training immediately .

D. Records on Participants

Teachers and head teachers: There were thirty-two Head Start teachers in the program. Demographic data appear below Names, position, and attendance records for Head Start teachers and parent teachers were not available to the evaluator.

Five experts taught modules on seven days from June 13 through June 22. They gave courses on nutrition, animals and homes, ecology, plants, earth and water, magnets and electricity, and the human body and senses. The Head Start teachers chose any four of the eight modules. The presenters accommodated the teachers' preferences but made some adjustments so that no classes had fewer than eight participants.

Children: Names, ages, and attendance records of the children were not available. However, the staff at the Neighborhood Resource Center produced a detailed report on enrollment, participation, and operations of the Head Start on Learning Science Summer Institute. The report, combined with observations and interviews, brought to light two groups among the younger children in the summer program: pre-Kindergarten, ages four - five; and primary school, ages six - seven. Eventually, children were assigned to one of three rooms based on this distinction,

with one room for primary school and two rooms for pre-Kindergarten.

However, in the first week the project's organizers were caught off guard. They had expected to operate two rooms for approximately 40 children. Instead, the initial registration of the pre-school population was 70. Attendance was so high that the teachers were overwhelmed. Every day for the first week, there was confusion and disruption. Children were reassigned to a different classroom, parents were in a hurry to get to work, children and parents were unsure which was the right classroom and who was the teacher—parent teacher, volunteer parent, or Head Start teacher. Attendance tapered off in the second week, allowing teachers to establish a basic routine. By the third week, attendance had dropped to approximately fifteen children in each room, which the teachers found reasonable.

Approximately fifteen fifth grade girls enrolled in the summer institute. Many of these girls attend the Eli Whitney school and are familiar with the Neighborhood Resource Center. They received science instruction from one of the parent teachers; took dance lessons; and occasionally helped the "smaller children with science projects, Lego activities, and other educational activities." They also received lessons on horseback riding, tennis, self-defense, citizenship, and African-American history.

During the third week the teen program started. Twenty-two teenagers (fourteen to nineteen years old) from the Lower Basin Neighborhood joined the program as teachers' assistants. Six - seven were assigned to each room. To some of the teachers, the teenagers were a nuisance and hindering work with the pre-school children. These teachers did not think of a way to organize the teenagers or persuade them to help with the pre-school program. However, other teachers easily got the teenagers to help, and their rooms were structured in ways typical of pre-school programs, with an important difference. The morning in Head Start pre-school began when the teacher sang and, with gestures, invited everyone else to sing along and hold hands in a circle—the teenagers, too. So, the three-foot high pre-schoolers there were standing in a circle, singing "Make a Circle," and holding hands with the six foot gangling teenagers. Everyone was laughing and singing. The little boys and girls often stared up in amazement at the big kids who were holding their hands and singing.

Parent volunteers: All of the parents actively involved with the Head Start summer program were women. Some of the fathers and grandfathers brought their children to the center, but few participated regularly. Names and records of attendance and dismissal were not available.

The Parent Contract for the Head Start Summer Science Program specified three conditions for enrollment of children:

- *That the parent(s) devote(s) a minimum of four hours weekly to pre-school sessions, parent programs, and field trips.*
- *That they support his/her child or children while they are enrolled in the program.*
- *That a child may be disenrolled if a parent does not participate at least four hours per week.*

There was no official report that a child was disenrolled because parents' participated too little or even though many fell below the minimum, especially from the third through the seventh weeks of the program. The staff at the Neighborhood Resource Center reported that attendance dropped "as the program matured." Some parents "voluntarily removed their child from the program. Other explanations given for a drop in attendance include a child's improper behavior, illness, and scheduled vacations."

Typically, only one parent was in each room each day. Examination of records of parents' participation in the other activities designed for them, such as the health club and round-table discussion has revealed that very few attended. The health club directors had a well-organized health and fitness program designed for individuals and small groups. Their enrollment figures were increasing, but by the seventh week of the summer program they had approximately twenty-five regulars. They were uncertain how many of these adults were involved in the Head Start Summer Science Program. The health club director estimated that five or six parents from Head Start came regularly out of the twenty-five registered.

Nonetheless, in response to the evaluator's request for documents, the health club co-directors submitted a statement of their conceptual framework, organization, policies, and materials. Because the document is important as an example and is relatively brief, it is quoted in full below (copies of their forms accompanied this document).

The Whitney Gym Fitness Center

The goal of the Whitney Gym Fitness Center is to provide free use of ten state of the art exercise machines and expertise in their use to a community which has no comparable services.

Initial information about the gym was spread through an advertisement (1) given to the parents of the children of the program, word of mouth, and an article in the City Courant.

Anyone 16 or older was allowed to become a gym member. The registration material consisted of four pages. The first page (2) asked for basic demographic information, a person to contact in case of emergency, a brief medical history, and insurance information. The registration material consisted of four pages. The second page (3) contained the detailed gym rules, which must be read and signed. The third page (4) asked for a detailed health history. The fourth page (5) was a release of liability. The registration information was kept in the gym in a file for that member. The new members were given a copy of the gym rules to keep. A summary of the rules (6) was posted on the gym door and at various places within the gym. New members were recorded on a special form (7) and then a laminated credit card sized membership card (8) was made for each member. Members had to show this card to enter the gym.

The gym was open from 8:30 to 1:00, Monday through Friday, July 5 through August 18. A trained volunteer supervised the members at all times. He was well acquainted with the proper exercise techniques of the machines and he instructed all new members thoroughly before they were allowed to use the machines. He helped the members maximize their workout and he guarded against injury from improper use of equipment or overexertion. Working with the supervisor was a member of the Lower Basin program who the supervisor had trained in the use of the machines and the functioning of the gym.

> "*A special program which we offer allows the members to design an exercise program with Steve's help. A schedule of exercises is created (9) and the number of minutes spent on each exercise is recorded daily. Blood pressure and weight are also monitored.*
>
> *At the end of the program, T-shirts will be given as rewards*

to all gym members. Also, awards will be provided based on the number of minutes each member spends in the gym. The time the members spend in the gym are recorded on sign-in sheets (10).

In the fall, we will continue to offer exercise services at only a modest fee. The hours will be changed for the greater convenience of our members. Services will also be expanded to possibly include aerobics and free weights.

We at the Neighborhood Resource Center are excited about the current use and the potential of our fitness center. We think that it is a great way to offer much needed exercise services and knowledge to improve the health of families in our community."

The explanatory material produced by the co-directors of the Whitney Gym Fitness Center, like that of the Neighborhood Resource Center's staff, is an outstanding example for the project to follow.

Parent workers: Several women were hired as parent workers (informally called "parent teachers") by the Head Start on Learning Science Summer Institute to "work along with another parent (presumably a parent volunteer) and be assigned to a specific component." They were paid $5.26 per hour. In preparation, the parent workers had to complete several training sessions, specifically, a nine-hour CPR course (3:30 - 6:30 on May 8, 15, and 22) and a four-hour course on early childhood education (9:00 - 1:00 on May 23). The contract specifies that parent workers are to:

(1) recruit families into the summer program.

(2) assist in the registration on May 16 & May 18 (9:00-2:00 and 5:00-8:00)

(3) attend staff meetings and training sessions as required.

(4) provide supervision to children in special groups.

(5) report on attendance/participation of parents and children in specific groups.

(6) assist in all paperwork including: filing, data collection, reports, etc.

(7) accompany students on all field trips or outdoor activities.

(8) assist in meal distribution to specific groups.

(9) any additional tasks assigned by the director.

Official records of participation, attendance, and dismissal were not available. However, interviews and observations reveal that four - five were women hired in this capacity. Most fulfilled their responsibilities for

the specified events, although one of the parent workers quit or was dismissed. However, since so few parent volunteers fulfilled their weekly four-hour commitment, and since only one Head Start teacher came each day for only two hours, the parent workers often assumed full responsibility for teaching in the program, without regular supervision by a certified pre-school educator.

As a group, parent workers welcomed the opportunity to teach in the program, and like the parents and Head Start teachers interviewed, they were very glad this program was available. However, in the one-to-one and small-group interviews, parent workers conveyed to the evaluator their disappointment at suddenly being given so much responsibility with so little coordination or guidance and so few materials. One of the parent workers said,

> *"Why am I supposed to be the only one in this room almost every day? The parents aren't coming in. There is only one Head Start teacher for the week, and I don't know where she is or if she is even here today. How am I supposed to know what to teach? There is nothing here for me to work with. All they have in here are Legos and wooden blocks. Where are the paints? Where is the sand table? Where is the water table? At the other school where I work, the rooms are filled with things. We have every wall, every corner filled with things for these kids to do. We have a regular routine, and the kids love it. And many of the parents are actively involved. Some days I come in here at 9:00 a.m. to begin my work, and somebody hands me a little piece of paper with a lesson for me to do. I haven't seen that lesson before. I have practically nothing to work with, and now I'm supposed to teach it. I had no time to prepare. This program is a great idea, we need something like this, but it's not run right."*

Data from interviews and observations show that this parent worker's perspective is representative of others'.

Technically speaking, there was a daily routine. The following daily schedule was posted in one of the rooms.

9-9:30 Arrive and Breakfast
9:40-10 Group time. Songs, finger play
10:45-11:25 Outside play
11:25-11:45 Dance activities. Story, free choice
11:45 - Clean up. Lunch
12-12:40 Lunch

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12:40- Story time
1 Dismissal

The summer program usually followed this schedule. However, since the list was not posted in each room, and since there was no program for curriculum development (to identify, plan, and coordinate lessons and activities of all the participants), most of any day's activity was more like the movements of a flock of geese than like a national model for early childhood education. Parent workers and teachers said they usually did what they felt like doing. Sometimes that meant staring into one of the rooms and wondering what the devil was going on, and at other times it meant sitting idly or dozing while the children played once again with the Lego blocks.

There were two foster grandparent volunteers who assisted the parent teachers and Head Start teachers.

Instructors: Records show that five science experts taught the thematic modules. Two principal investigators took responsibility for organizing and presenting the core and thematic module components. Principal investigators also took responsibility for providing instruction or guidance in other aspects of the program, such as round-tables, the health club, gardening, and family science nights.

A specialist in African dance presented dance lessons to all of the children once each week. Also, an expert in music and drama provided instruction in structured body movement to all of the children once each week

E. Programs

After preliminary analysis of data from the summer institute and earlier segments of this project, the evaluator made specific recommendations to the principal investigators. These recommendations were intended first of all to help the project's administrators pull together the different elements they had developed and write the formal description of what they believe to be their national model for a Head Start program. The proposals were not the actual program, and besides, they presented a fuzzy picture of the project. Prior to this time no official records or documents of meetings or conceptual frameworks were shown to the evaluator (important exceptions are materials prepared for the core and module components). Secondly, the recommendations were intended

to help the administrators develop an organization and some policies that would counteract the fragmentation of the summer program. Several components had failed or were flagging. Parents were not fulfilling their responsibilities. Thirdly, interim recommendations were meant to focus the administration's attention on program development, because experienced and knowledgeable participants (as well as the evaluator) had concluded that the project lacked a clearly stated mission, also a curriculum, and development and coordination of programs, all were necessary for the project's success.

In June and July 1995 the Head Start on Learning Science project arrived at a critical stage at which its good intentions had to prove themselves in practice. It was clear when the summer institute started that some people were beginning to panic. That is normal. There was still time to resolve the issues about formal definition of the project's conceptual framework, curriculum, and administration, all the things essential for identifying, managing, and assessing its operations.

Unfortunately, not everyone took seriously the recommendations to formalize the project's operations. The documents produced were too brief and informal. Many of the items requested of the project's administration (e.g., time line, references to supporting research literature, selection criteria, records, and means of assessment) were left blank or treated as if unimportant. The material on curriculum design and development showed little or no acquaintance with educational theory and practice as applied to adult learning and lifelong education (seemingly necessary, if the education of the whole community is at stake) or early childhood education. Some records sent by one of the principal investigators were either lost or discarded in the project's main office.

In the revised proposal, the principal investigators wrote that, "The greatest need is not to change these Head Start teachers and aides, but to magnify their impact. We need to teach Head Start staff to enhance effectiveness in helping parents help children." Instead of trips to nature centers, as planned in the original proposal, parents would come to the "laboratory" housed in the Eli Whitney School and be put "in charge of pre-schoolers in a classroom setting with supervision by qualified teachers." Head Start teachers would instruct the parents on "early

childhood education, with a particular emphasis on science." Also, a variety of programs, like the round tables, health club, and gardening would not only improve the parents' knowledge and skill with natural science, but also provide opportunities for them to improve their personal health.

But very few parents participated in the Head Start on Learning Science Summer Program. By the middle of this summer program only one Head Start teacher was at the site two hours each day (there was a different Head Start teacher each week), and she was given no program for working with the children or parents. But the parents were not around and there were no more than thirty pre-school children. Without the parents' participation and without the full development of most programs, the project is not accomplishing its stated objective. It is unclear how this awkward and incomplete beginning would transform itself into a dynamic national model starting September 1995. Furthermore, this two-year project was entering its second and final year, during which it should be expected to accomplish most, if not all, of its goals.

Core component and science modules:

The materials developed for the core component and science content modules, along with the in-service program itself, were some of the best work produced by the Head Start on Learning Science project. The in-service training of teachers, like teaching college courses, is expected of university professors and thus something at which some excel. According to Head Start teachers the university professors and outside specialists presented a very good in-service program. The professors themselves concluded that their work was well received. Some of the Head Start teachers established contact with the professors asking for more help with their own professional development.

Highlights of the core and thematic module components follow. In February 1995 the project as originally designed was explained to the Head Start teachers. Then the teachers were asked to complete a survey to indicate their preferences for the two components, including time, frequency of daily sessions, and themes for modules. The teachers' seven preferences were then made the options for the thematic modules, and each teacher had some choice of topics.

The teachers' opportunities for individualized instruction were emphasized by offering the core component at both the South City and City sites. The core component consisted in twelve hours of instruction

in teaching science with Head Start children in the "constructivist" philosophy of teaching science, and in science skills such as observing, comparing, and sequencing. Throughout the core component, hands-on activities showed the teachers how they can use science to help children to discover and talk about the things in their world. Children's literature and pre-writing skills also got their due. A children's book sales consultant demonstrated that science books were relevant to the four-five-year-old age group. Teachers used funds from the grant to buy books and materials for their classes. Also, each of the teachers received a science kit, and each building received a collection of science materials for all the teachers there. The text for this in-service, *Science Experiences for the Early Childhood Years*, fit the project exactly and was appreciated by teachers.

The thematic modules had the teachers study four different topics (chosen from the subjects of animals and homes, ecology, plants, earth and water, magnets and electricity, and the human body and senses) for six hours each. Outside experts (such as from the Iron Mountain Science Center) conducted the modules, working closely with the learning teachers, and emphasized observing, asking questions, and having fun with science. Each module lasted for three days, which allowed each teacher to attend four different topics. On the last day, time was set aside for teachers to share what they had done in each of the modules and to provide feedback about the summer institute. When a teacher completed thirty-six hours in the summer institute, she received three credits for course work from the private university.

In summary, data from survey instruments revealed that Head Start teachers were satisfied with the quality and organization of the core training and module sessions. They also appreciated the lengths to which the project went to accommodate their needs. Their greatest area of concern was communication and organization within the project itself. Initial planning was poor, leading to unclear communication, constant changes, and confusion. The problems parents saw in the babysitting program also seem to stem from poor initial planning. The problems with organization and communication are further illustrated by the uncertainty that surrounded participants' understanding of goals and procedures for the project's second year.

IV. Discussion

The style and language of the proposal made it difficult to read. No one should expect proposals to be literary masterpieces, but they should present a theoretically sound and logically developed idea. Typically, proposals begin with an argument for the need, followed by formal statements—specific and interrelated—of goals, objectives, and activities. A time line shows what will be done, when, and by whom (see Locke, Spirduso, and Silverman 1993). Certainly, demonstrated need, clarity of purpose, and logical development are the distinctive features of proposals associated with the State Academy for Education in Mathematics, Science, and Technology, a principal collaborator in this project. In contrast, the Head Start on Learning Science proposal had a loose and rambling style that presented a fuzzy picture of the need, the conceptual framework, and the operations of the two Head Start programs, their communities, teachers, children, and parents. As it turned out, the proposal's style and content presaged the first discovery made by the principal investigators: they had made false assumptions about the actual conditions of education at the two Head Start sites.

The in-service of the Head Start teachers was the main element of the original proposal. Data show it is the project's most successful aspect. Indeed, the project would have accomplished its main goal to the extent that it remained committed to the professional development of Head Start teachers' knowledge of science and their skill in teaching science in developmentally appropriate ways to pre-school children.

Helping teachers to help parents prepare their four - five year old children for learning science became the project's top priority during the winter of 1995. Data show that participants perceived this step as laudable, even welcome. However, the 1995 Head Start on Learning Science summer program ran into serious difficulty with this policy, falling short in communication, conceptual framework, planning, and operations. Communication was lacking among the principal investigators before the summer and became a real hindrance to the project during the summer. The core and science modules helped the Head Start teachers improve their science knowledge and teaching skills, and more appreciation for it. In contrast, these same teachers (as

collaborated by statements from parent teachers and others) gave low marks to the summer program, citing poor development of the idea, no curriculum design, and loosely organized daily operations. Perhaps the most telling evidence was in the children's frequent playing with Lego blocks. The experienced Head Start teachers were surprised to find so few things for the children to do in the classrooms and attributed the teachers' and children's boredom to this.

When university professors design courses and offer in-service programs, they exercise their strengths. When university professors attempt to design and implement an external program intending to change not only the way local parents introduce their pre-school children to science, but also to change their beliefs and values regarding life in general, they take on a great challenge and a tremendous risk. The need to break the cycle of poverty and its related problems is one of the deepest issues in America today, but painful lessons from botched efforts in the past have shown that the battle against poverty must not harm or destroy local culture. The university's roles in the Head Start on Learning Science program should be ongoing in-service and consultancy on the basis of needs perceived by the Head Start teachers and parents, not the external direction or forceful institution of new programs. This project needs reform putting the responsibility for initiative and decision-making in the hands of the local community.

Several participants noted that the eight-week Head Start summer program was too long for many of the participants, especially since the project suffered from poor communication, lack of planning, and poor daily organization. Either the summer program should have been only four or five weeks long, or there should have been two summer sessions of four to five weeks each. Much evidence shows that the attitudes and perceptions of both children and parents soured as the weeks wore on. During the sixth week, one teacher said, "For all intents and purposes, the summer Head Start on Learning Science program is over at this point. Enrollment has dropped. Parents dropped. It was too long, and they [participants] were not doing much here."

Everyone was waiting for something to happen in the summer program, but it fell short of the participants' expectations. As a result, the local community did not become involved so as to make the Head Start

on Learning Science program what it should have become. As yet, no one is clear about (and there is no formal statement on) the linkages between the original proposal, the revised proposal, and, especially, the manner and extent to which the summer program will influence the project's operations during its second and last year.

There was misunderstanding and misinterpretation of the urban African-American culture, leading to unintentionally, hurtful and insensitive behavior toward individuals and groups. In the words of one African-American parent who participated in the Head Start on Learning Science summer program, "These people [university professors] have no real acquaintance with African-Americans who live in the urban setting." To illustrate her point, she explained there were several occasions when groups or individual African-American parents were told, "You *people* need this program." This expression is commonly taken as derogatory and should never be used.

In conclusion, the Head Start on Learning Science project was accomplishing one of its original goals, namely, to provide a professional development program to Head Start teachers emphasizing science knowledge and science teaching skills for pre-school children. The new policy of increasing parents' participation in the Head Start programs in South City and City met with considerable difficulty during summer 1995. The project's problems with poor communication, lack of a formal conceptual framework, and personnel contributed to the summer program's fragmentation. Recommendations for the program's improvement were offered.

V. Methodology

The purpose of this evaluation is to assess Head Start on Learning Science's pursuit of the overarching goal of school reform to improve learning which leads to high achievement in challenging science by all students.

The design for evaluation included planning, formative, and summative elements. Planning evaluation was a recurrent interest in assessing an understanding of Head Start on Learning Science's goals, objectives, strategies, and time lines. The main concern on the part of the external evaluator was to determine if appropriate steps were being taken to assure that appropriate conditions have been established for evaluation of the project. During the course of the three years, the principal evaluator would be invited to participate in all discussions concerned with development of the external evaluation.

Formative evaluation assessed the ongoing activities of Head Start on Learning Science to determine if the project was conducted as planned and the manner and extent to which the project was meeting its goals. Qualitative methods included observation of activities and events, such as formal and informal meetings, workshops, and conferences; participation in events, such as site visits from local officials and other evaluators; structured and non-structured interviews with key participants; and collection of documents. Sustained, site-based interviews were conducted with all of the principal players associated with Head Start on Learning Science to acquire testimonials—first-hand authentification of facts—as well as descriptive details of the project's operations. The list of persons interviewed included principal investigators, staff, experts in the field of Head Start, parents, Head Start students, and high school students. A collection of survey instruments was prepared to assess the effectiveness of Head Start on Learning Science in accomplishing its goals and objectives. Analysis of survey data relied on quantitative and qualitative methods.

Summative evaluation would be used to assess Head Start on Learning Science's overall success. The main question was, "What were the project's strengths and weaknesses, particularly, in reference to the goal

of systemic reform, which is to significantly improve learning that leads to high achievement in challenging science by all students?" Methods of data collection and analysis for the summative phase were the same as those in the formative phase, including survey instruments to assess perceptions of Head Start on Learning Science's effectiveness among the range of participants.

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